

Long-term fluctuations of economic growth and social destabilization

Eisner, Manuel

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:
GESIS - Leibniz-Institut für Sozialwissenschaften

Empfohlene Zitierung / Suggested Citation:

Eisner, M. (1992). Long-term fluctuations of economic growth and social destabilization. *Historical Social Research*, 17(4), 70-98. <https://doi.org/10.12759/hsr.17.1992.4.70-98>

Nutzungsbedingungen:

Dieser Text wird unter einer CC BY Lizenz (Namensnennung) zur Verfügung gestellt. Nähere Auskünfte zu den CC-Lizenzen finden Sie hier:
<https://creativecommons.org/licenses/by/4.0/deed.de>

Terms of use:

This document is made available under a CC BY Licence (Attribution). For more Information see:
<https://creativecommons.org/licenses/by/4.0>

Long-Term Fluctuations of Economic Growth and Social Destabilization

Manuel Eisner*

Abstract: The following article combines two objectives. First it presents a data-set of economic and social indicators which relate to the development of the canton of Zurich from 1832 to 1983. Second it discusses some empirical patterns discernible in the data in order to test some aspects of a theory of social change. The results seem to support a strategy in historical social research that accumulates related cultural, political, social and economic indicators for a limited area. These may then be examined by available statistical methods.

1. Introduction

Due to numerous wars and political changes continuous time-series stretching over a period of approximately 150 years are very rare in continental Europe. Switzerland with its stable political structure is an exception. Within Switzerland the canton of Zurich initiated statistical surveys on a number of state activities in the early 19th century. These are the basis for the data-set presented here. During the whole period considered here Zurich - with 1.2 million inhabitants today - remained the economic center of much of north-eastern Switzerland. Therefore our data may be regarded as relevant in terms of the economic and social dynamics of this larger region.

On the basis of the data presented below, we test parts of a theoretical model which assumes that the recurring alternation of *stability* and *crises* is a dominant feature of modern dynamic societies. This empirical work is part of a larger research project in which economic, social, political and cultural indicators are collected and made available for systematic tests of theory-derived hypotheses. (1) For this reason I have also raised a number of cultural indicators based on a content-analysis of newspaper editorials. Related research has been presented elsewhere (Eisner 1990, 1991a, 1991b, 1992).

* Address all communications to Manuel Eisner, Soziologisches Institut der Universität Zürich, Rämistrasse 69, CH-8001 Zürich.

2. Discontinuities in social change as a theoretical background

My theoretical argument is based on the general assumption that long-term fluctuations of social change in modern societies result from an interplay between: a) the dynamics of economic growth, b) their social and structural consequences and c) the degree of social and political stability. Its core proposition may be formulated as follows: *a) economic growth has stabilising effects in the short run, but destabilizing effects in the long run and b) social restabilisation is a precondition for economic growth.*

I therefore regard economic processes as part of a social dynamic characterized by a recurring succession of crisis and stability. This assumption is not new. Both within »long wave« research as well as within the »long cycles« tradition it has been emphasized by those authors who have aimed to overcome a purely economistic viewpoint. Among these, two approaches are especially noteworthy for the following argument. The economic historian *Hansjörg Siegenthaler* (1978, 1980, 1981, 1984) was first to develop the above-mentioned assumptions in the late 1970/1/2s. The so-called »long cycles« with a duration of 14 to 25 years are his observational units. His argument is based explicitly on the assumption that »economic growth undermines structural stability and that structural stability promotes economic development (Siegenthaler 1981: 19). (2) The main reasons for the destabilization of orderly structured patterns of action mentioned by Siegenthaler are *unequal participation in growth, devaluation of existing professional and everyday capabilities, rapidly changing relative prices and diverging demands on the state*. Periods of crises are overcome by *communication processes within economic and political elites* which eventually result in a *resumption of confidence*.

Bornschier (1988) on the other hand stresses global forces. He assumes the so-called »long waves« of about 50 years 1/2 duration to be the central rhythm of social change. His theoretical model sets out to explain the economic process as a result of several social forces. He starts with the idea that social restabilisation during a period of crisis is based on the success of a new societal model (Gesellschaftsmodell). Such a societal model combines a *new normative order*, a *modified political-economic regime* and a *new technological sstyle*. It thus substantially lowers social conflict for a certain period. Growing instability within western societies during the final phase of a societal model rests according to Bornschier on the decreasing problem-solving capabilities of the old political-economic regime, increasing saturation of markets, the closure of channels of vertical mobility, growing politicized aspirations as well as technological innovations which undermine the existing style of economic production (Bornschier 1988: 30ff). (3)

3. Fluctuations of economic growth and social destabilization

The following argument integrates several aspects of the theories mentioned above. It models economic growth and social destabilization as mutually interdependent processes. (4)

According to this model, rapid economic growth has both stabilizing and destabilizing effects. At the beginning of a period of prosperity, stabilizing effects prevail: growth reduces conflicts which are due to the unequal distribution of goods because the whole social structure is on an upward move. This phenomenon is also known as the »paternoster effect« (Bornschier 1988, Hirsch 1976). Moreover, national economic growth will be perceived socially as a proof of international success and competitiveness. Thereby it has both politically and culturally legitimating effects. Finally, economic expansion may improve the possibilities for individual attainments and thus lower the probability of individual frustrations.

But economic growth also has negative effects. However, their impact is only felt as they cumulate over longer periods of time. According to Imhof and Romano (1988, 1989) these processes may be summarized as the *unintended consequences of rapid social change* (Giddens 1988). On the basis of the above mentioned authors, I emphasize the following three arguments. (1) Economic expansion changes social patterns of distribution; the gains from economic growth are not equally distributed across sectors and regions (Olson 1971). Every thrust of growth creates new booming regions and leaves behind new peripheries with stagnating economic sectors, declining numbers of work-places and the emigration to the new centers of growth. (2) New technological and organisational patterns of economic production make themselves felt as changes in the criteria for job-qualification. Up- and downgradings of old and new professions modify the pattern of prestige in a society. Parallel to this dynamic, the channels for social mobility change, resulting in a modification of the bases of economic and political power. These changes are legitimated through the acceptance of new patterns of status ascription by which the gratifications expected become linked to investments made (Bornschier 1988). The potential conflict resulting from these processes remains low as long as individuals can adapt to them by appropriate strategies such as the acquisition of educational certificates. Only when the channels of mobility become saturated as the potential for the absorption of newcomers is exhausted, do frustrations increase rapidly because of the growing gap between value expectations and value achievements (Davies 1962, Gurr 1970). (3) Finally, every period of fast growth generates new economic, political and social problems about which it is impossible to generalize. When they first appear, contemporaries can hardly assess their implications and their political relevance. Furthermore adequate institutionalized rules to deal with new problems do not yet exist. Both of these have destabilizing effects on political elites and the broader society.

This argument leads to the hypothesis that social destabilization begins *before* the onset of an economic crisis. (5) The economic crisis itself intensifies existing social tensions and causes a further increase in instability. Now the well known gap between *expectations* and *satisfaction* opens widely (Johnson 1973, Davies 1969, Gurr 1970). During the phase of an economic downward trend, however, processes of restabilisation get underway. Several arguments pertaining to the dynamics which result in increased stability have been made. Siegenthaler assumes that during periods of crises, economic and political actors switch towards a mode of fundamental learning which eventually generates new rules of information processing. Taking the Kondratieff-cycles as his point of reference, Bornschier (1988) argues that crises are overcome by the adaptation of a new political-economic style to the technological style. For Imhof and Romano (1988a, 1988b, 1989), the process of restabilisation is a consequence of the ideological activity of new social movements. They produce new world-views that eventually become integrated into the dominant political discourse. In a similar way, Eisner (1991) assumes that the manifest political articulation of conflicts originating from social movements can be understood as a first phase of structuration of the latent and diffuse conflict potential at the beginning of a crisis.

4. The problem of valid indicators

The theoretical approach outlined above assumes that economic dynamics and social stability are mutually interdependent. The next question is whether the assumed effects can be tested empirically. The answer depends on whether or not indicators can be found that represent the crucial variables with sufficient precision. This problem is known within survey research as the question of construct validity. It has to do with whether questionnaire items adequately measure the theoretical construct. Within historical social research this problem becomes even more acute. The gathering of historical data is always a non-reactive procedure which cannot generate new information by presenting stimuli such as questionnaire items. Rather, theoretically based indicators have to be constructed out of a data base that can hardly be enlarged. This puts narrow limits on the operationalization of theoretical constructs.

The problem of a valid indicator is more acute for the concept of social stability than for the concept of economic growth. Over the whole period from 1832 to 1983, we use estimates of the volume of building investments as an economic indicator. These data do not directly measure economic productivity, but comparisons with the growth rates of gross domestic product for a subperiod (1945-1983) show that the turning points of long-term economic fluctuations are adequately identified.

Rather more difficult is the construction of an indicator which can represent the complex and unobservable concept of social destabilization. I approached the problem by assuming that social stability can be interpreted as a high acceptance of shared norms of action and a high legitimacy of the social structure. In contrast, a society may be regarded as unstable if the normative structure lacks legitimacy among large segments of the population. This concept leads to the assumption that social destabilization manifests on the level of individuals as an increased tendency towards *deviant behavior*, which violates the normative order of a society. Moreover we assume the amount of instability to be larger if the tendency towards increasing deviance can be observed in different fields of action and across social classes.

On the basis of this argument, the appropriate empirical strategy consists in a comparison of indicators of different kinds of deviance and a testing of their assumed covariance over time. However the availability of data in the historical sources strongly limits the number of usable variables. Fortunately we dispose of a relatively great number of different relevant time-series in the canton of Zurich. They can be compared and allow for estimates of overall changes in the frequency of deviant behavior. More precisely, I use the following four indicators which measure very different kinds of behavior. These are

- The yearly number of persons convicted according to cantonal (until 1941) and Swiss (from 1942) penal law as well as according to the drug law.
- The yearly number of suicides.
- The yearly number of seizures or distraint by **legal process in the case of** debt imposed in the canton of Zurich
- The yearly number of civil law suits completed.

All four indicators measure the frequency of officially registered violations of norms of conduct. (6) Let me comment briefly on some aspects.

Both suicide and crime are widely used sociological indicators for anomie and social instability. In the now classical study by Henry and Short (1964) on suicide and homicide, these behaviors are understood as internal and external manifestations of individual strain. The use of legal seizure and civil law suits as indicators of social tensions is rather uncommon. Their inclusion may be substantiated as follows: distraint can be interpreted as a rather direct indicator of the consequences of an increased gap between the expenses effected by an individual and the actual financial means at his disposal. This situation can be understood as a variant of the gap between culturally transmitted *aspirations* and economic *resources*. Also, the frequency of civil law suits can easily be interpreted as a manifestation of social conflict. Even if the reasons for civil law cases are very heterogeneous one may assume that their general background consist in conflicting interests between individuals or groups on a level of such intensity that they are brought to court.

5. The Data

The data set discussed here contains several data series on the canton of Zurich throughout the period from 1832 to 1983. The raw data together with the sources are listed in the appendix.

a) Fluctuations of economic growth

In order to estimate the process of economic growth, I used the level of gross building investments. This has been widely used as a measure for capital accumulation in the 19th century. For the period from 1832 to 1913, I used the data published in Beck (1979). For the period from 1914 to 1945, I continued the series with the source used by Beck, e. g. the yearly estimates made by the public fire insurance institution (Brandversicherungsanstalt). From 1942 onwards the »Bundesamt für Konjunkturfragen« produced its own estimates of building investments. The years from 1942 to 1945 were used to adapt both series to each other. I deflated the data by means of an index of building costs constructed by Bernegger (1983) until 1913 and the official index of building costs from 1914 onwards.

Figure 1 presents deflated yearly building investments per capita. They exhibit a long-term exponential growth trend (slope approx. 1.7 percent) made visible as a linear increase by means of a semi-logarithmic scale. Also, a saw-tooth-like pattern of increasing and declining capital accumulation can be seen. Up to the 1930/20s its periodicity is highly regular, but the period after 1950 is characterized by a considerably stretched period of growth (apart from a slight decline of building activity in 1957/58).

b) Criminal Activity

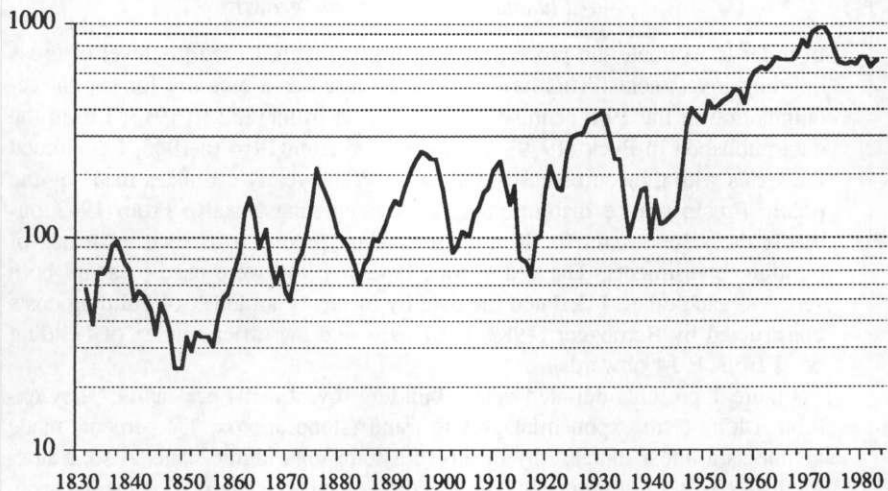
Since 1853 the »Rechenschaftsberichte des Obergerichtes an den Zürcher Regierungsrat« (reports of the high courts to the government of Zurich) present figures on the number of convicted persons differentiated according to a number of relevant criteria. Most of the data were gathered in 1939 by Erwin Hacker (1939). (7) From 1931 onwards, our data are based on the figures presented in the statistical yearbook of Switzerland. From 1970 on, I included the convictions based on the law against illegal drugs (Betäubungsmittelgesetz), because they constitute a considerable part of all criminal convictions. However, convictions of military personnel have been excluded from the data. Conviction rates have been calculated on the basis of the population in the canton of Zurich older than 14 years of age. They are presented in Figure 1b.

In addition to strongly marked fluctuations, the figure shows a long-term declining trend of conviction rates. A rate of about 1200 convicted persons per 100 000 in 1850 is followed by values between 800 to 1000 up until the First

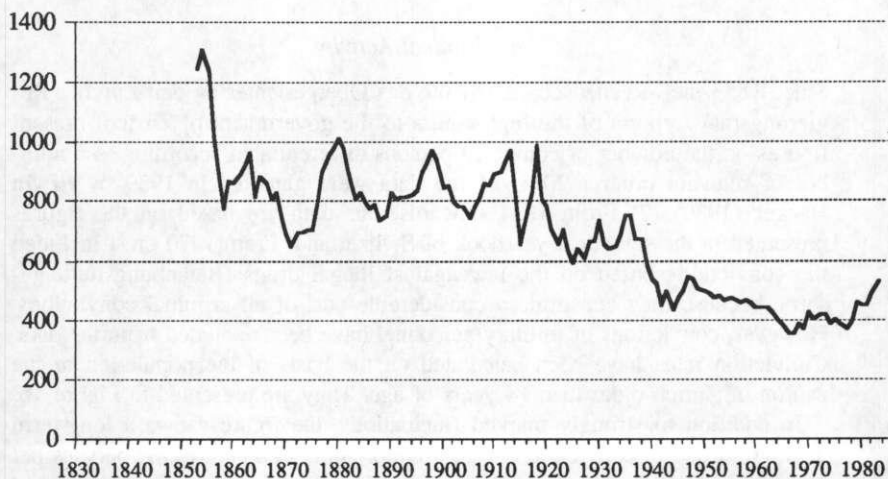
Figures 1a) to e)

Indicators of Economic Growth and Social Destabilization
(per 100 000 < 14 Years of Age)

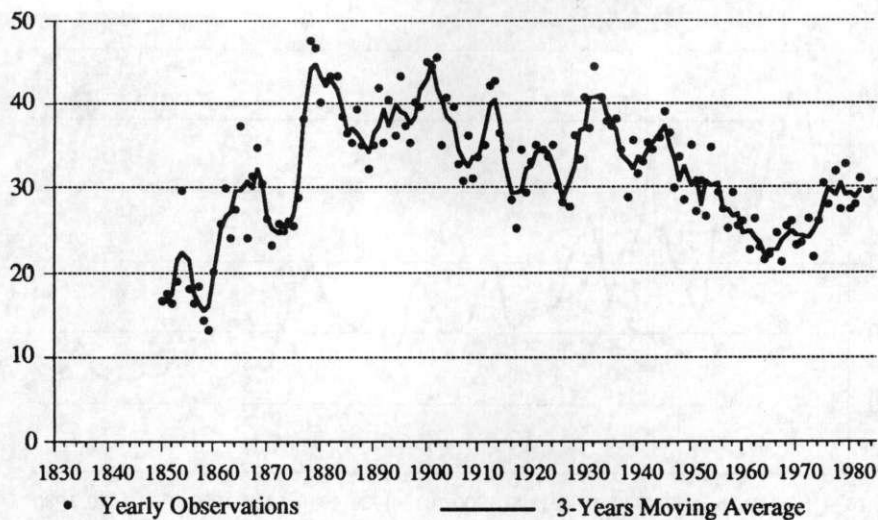
a) Gross Building Investments (from 1850 onwards deflated)



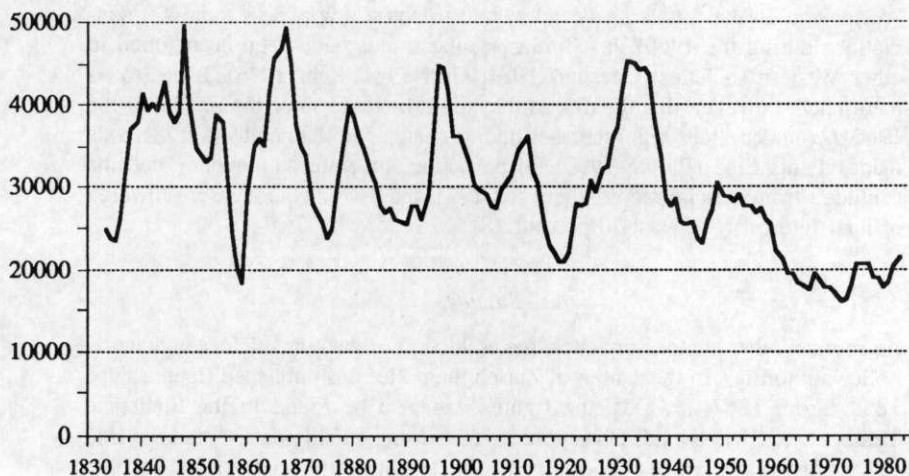
b) Convicted Persons



c) Suicides

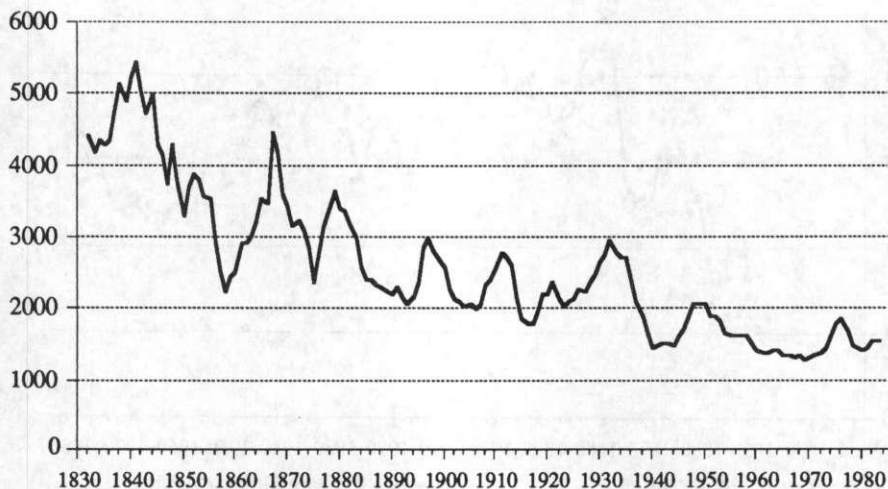


d) Legal Seizures



Note: Discontinuity in 1891/92 removed by multiplication of the time series from 1832 to 1891 with 0.572.

e) Civil Law Suits



World War. In the following decades, rates reach a low of less than 400 convictions during the 1960/1/2s. Similar secular trends have been found in other Western societies (Chesnais 1981, Gurr 1981, Zehr 1976). It has to be mentioned, however, that the discernible slight increase since the middle of the 1960/1/2s undervalues real increases due to changes in data collection methods made at this time (Balvig 1990). In particular, juvenile delinquency became excluded from official records between 1971 and 1976. This measure lowered official figures by at least 30 percent. (8)

c) Suicides

As in most other cantons or states, the collection of data on suicides is done by police authorities. In the canton of Zurich the police has published figures since 1850. From 1867 onwards, the figures can also be found in the Statistical Yearbook of Switzerland. One problem with using suicide data is that we find rather low yearly values especially in the 19th century which leads to high yearly fluctuations. Therefore I calculated 3-years/2 moving averages in order to make regular patterns better discernible. These are the data used in further analyses. They are presented in Figure 1c.

From 1850 to the 1880/1/2s the data show a strong increase of about 100 percent. This reflects the transformation of society in the direction of an urban and industrial social structure and an accelerated dissolution of traditional

forms of solidarity (Dürkheim 1983). The peak of about 45 suicides per 100,000 inhabitants was reached shortly before the end of the last century. From then onwards we observe a declining trend until the middle of the 1960/2s, followed by a second increase until the end of the time series.

d) Legal seizures (Betreibung, Pfändungen)

The third single indicator for the extent of social destabilization is the frequency of legal seizures in the case of debtors in the canton of Zurich. In 1890/91 a new debt distraint law was introduced in Switzerland. As a consequence, the raw data in this year display a strong discontinuity. The series before and after the break have been matched, assuming that the frequencies of seizures were equal in 1890 and 1891 (see figure 1). Although this makes interpretation of long term trends more difficult, I assume that the average frequency of seizures remained approximately constant until the 1930/2s. Afterwards this shows a decreasing trend. However, the rather slight decrease confirms that seizures are not to be understood as a reflection of absolute economic scarcity but rather as a manifestation of relative deprivation.

e) Civil law suits

A fourth indicator used here is the frequency of civil law cases. I included only those cases where the justices of peace work as the first court instance. (9) Under their jurisdiction are actions for claims (Forderungsklagen) which today make up the largest part, divorce and paternity cases and other kinds of individual conflicts. Because of the large proportion of economically- motivated suits this indicator is related to the indicator of distraints. Again, the source here are the Rechenschaftsberichte des Obergerichtes an den Kantonsrat.

The rates are presented in Figure 1e. They show a gradually declining long-term trend as well as marked cyclical fluctuations.

6. A spectral analysis of the data

Before I discuss the interrelations between the time-series, I examine the existence of cyclical components within each single series. This will also help to clarify whether within that frequency-band possible cycles exist. I therefore performed a spectral analysis for all time-series. (Granger and Hatanaka 1964, Schlittgen and Streitberg 1978). Mathematical details cannot be discussed here. The procedure transforms a weakly stationary time series into a series of sine- and cosine waves with the periodicities [infinite, N , $N/2$, $N/3$, $N/4$, ..., $2*N/N$]. The spectrum at a given frequency indicates the proportion of variance explained by this single wave (Metz 1988).

A spectral analysis of time series requires a large number of observations. However, all of our time series surpass the 100 observations that are usually regarded as the minimum. Second, the time series to be analysed are required to be weakly stationary. They should have neither trends in means nor in variance. The series discussed above do not fulfill this requirement. We therefore computed logged first differences before performing the spectral analysis (Ewijk 1982). Mathematically this transformation is equivalent to the computation of growth rates. It eliminates trends and very long waves, whereas short frequencies are somewhat amplified.

Following the standard practice I present the smoothed-out spectral density function using a Tukey-Hamming-window. (10) The results are presented in Figures 2a to 2e. All of the five spectra confirm the existence of cyclical components. Especially noteworthy is a strong peak within a narrow band of the low frequency domain. The spectral density function of suicides has a first peak at a wave-length of about 16 years, whereas the criminal convictions contain cycles at around 12 years length. We can therefore conclude that each of the series analysed contains a cyclical component with an estimated duration of between 12 and 16 years. This periodicity is in accordance with the pattern expected by the theory of long cycles.

However, neither the visual inspection of the original time-series nor the results of spectral analysis yields support for the existence of long waves with a duration of approximately 50 years.

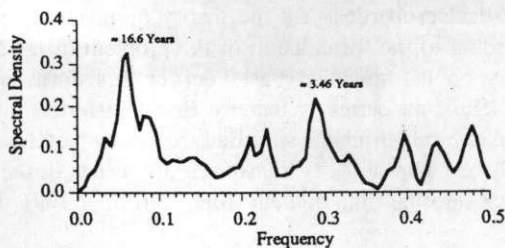
7. The application of a linear filter on the time-series

Our theoretical model assumes interrelations between long-term fluctuations. By means of spectral analyses they have been identified as rhythms of the Kuznets type. On the basis of these results, the following two questions are in order.

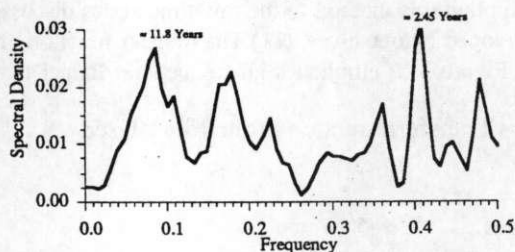
- Are the four indicators of deviant behavior (convictions, suicides, distraints and civil law suits) driven by a common force that may be interpreted as a oscillation between destabilization and restabilization?
- Does the interrelation between economic fluctuations and the indicators of destabilization show the expected pattern? Does instability increase during the final period of prosperity, and is there a tendency towards higher stability during the depression period?

In order to answer these questions one would like to observe the identified fluctuations without any disturbances. We therefore need a method which eliminates both trend and high-frequency fluctuations from the time series. However, distortions should be excluded within the frequency band that is of interest. Procedures used formerly, such as the fitting of polynomials of the

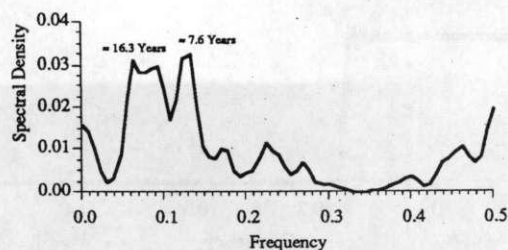
Figures 2a to 2d Spectra of the Time Series after Logged First Difference Transformation
Building Investments



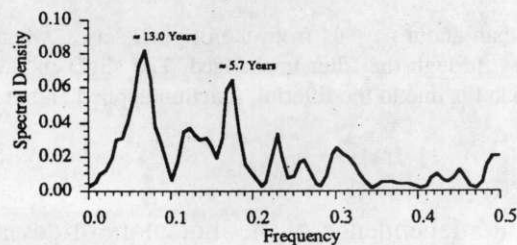
Criminality



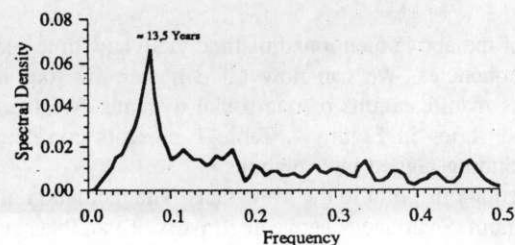
Suicides



Legal seizures



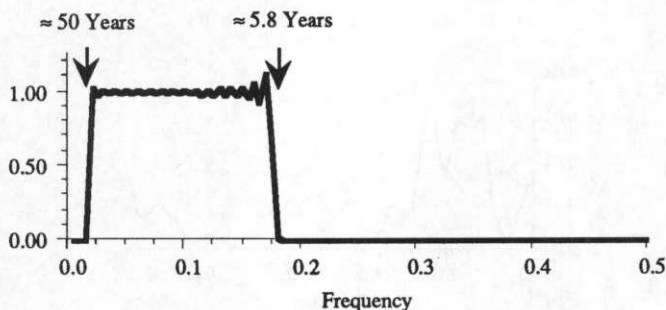
Civil Law Suits



application of moving averages, are no longer used because of their uncontrollable statistical properties. Yet the theory of linear filters allows precise filtering according to the formulation of the problem (Stier 1989). It is based mathematically on the so-called Fast Fourier Transform and the theory of linear filters. The time-series is thereby first transferred into the frequency domain. There one can eliminate specified frequency bands from the spectrum. Finally the filtered data series is transferred, by means of the inverted Fourier transform, back into the time domain (Metz and Stier 1991, Metz and Thome 1990).

We have applied this method to the raw time series discussed above using a program developed by ourselves. (11) The transfer function of the filter used is presented in Figure 3. It eliminates all frequencies longer than about 50 years

Figure 3 Transfer Function of the Filter Used



and shorter than about 6 years from the original series, whereas all other frequencies pass through the filter unchanged. The slight modulation within the transferred band is due to the filtering function applied and may be regarded as negligible.

8. The interdependence of the indicators of deviant behavior

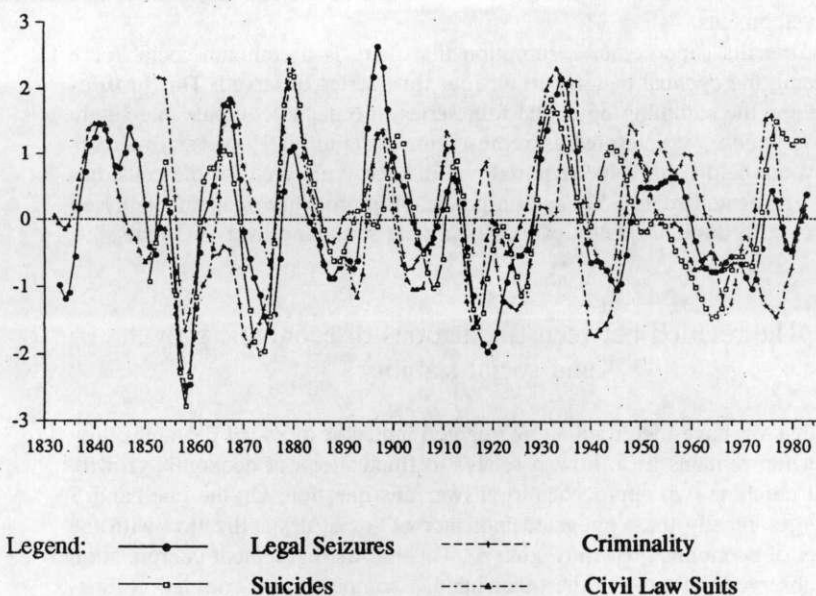
The results of the above mentioned method yield new time-series without trend and high frequencies. We can now ask whether the four indicators can be interpreted as manifestations of one social dynamic. We therefore present the z-transformed series in Figure 4. Table 1 presents correlations between the variables including lagged interrelations.

Both presentations point to the same facts. The tabulation of intercorrelations shows maximum covariances between all pairs of variables at simultaneity. We conclude that there is no phase angle between the series and that cyclical

Table 1 Cross-Correlations of Indicators of Deviant Behavior, Lags Ranging from -2 to +2 Years, 1852-1980, Peak Correlations are Printed in **Bold**.

| | Criminality | | | | | Legal Seizures | | | | | Civil Law Suits | | | | |
|-------------|-------------|-----|------------|-----|-----|----------------|------------|------------|-----|-----|-----------------|------------|------------|-----|-----|
| | lag | | | | | lag | | | | | lag | | | | |
| | -2 | -1 | 0 | +1 | +2 | -2 | -1 | 0 | +1 | +2 | -2 | -1 | 0 | +1 | +2 |
| L. Seizures | .35 | .46 | .49 | .45 | .32 | | | | | | | | | | |
| C.L. Suits | .25 | .34 | .35 | .28 | .11 | .57 | .71 | .73 | .62 | .41 | | | | | |
| Suicides | .28 | .36 | .39 | .33 | .18 | .53 | .63 | .63 | .51 | .32 | .37 | .50 | .57 | .53 | .40 |

Figure 4 Overlaid Curves of Four Indicators of Social Destabilisation (Z-Transformed)



movements are largely parallel to each other. The largest correlations are between legal seizures and civil law suits, whereas the interrelations between the indicator of crime and the other three variables are rather low.

Figure 4 allows for a more detailed investigation. First one can see a high overall parallelity between the series. However, there are also differences between single cycles.

Some of the turning points of all four variables occur either at exactly the same year or are only a few years apart. This is the case in 1858 or 1888 (lower turning points) and 1880 and 1911/12 (upper turning points). However, other cycles show a more dispersed pattern of single turning points. Thus there are maxima between 1932 and 1936 as well as minima between 1964 and 1967. In addition to this, there are some special movements to be observed in a number of years. Three of them may be noted. During the last years of World War I the crime indicator displays a marked upward movement. This is due to increased property crime as a consequence of the scarcity of food. During World War II there is an increase of suicides to be observed which is not matched by the other indicators. Finally, there is a surprising decline of crime in the early 1970s. This movement is exclusively due to the changes in official registration (exclusion of juvenile delinquency) as mentioned above and does not reflect real developments.

These results support our assumption that there is a common social force influencing the cyclical patterns in all four time-series observed. This justifies in our view the summing up of the four series in order to compute one single indicator which we interpret as representing instability. However, intercorrelations are below the value required within survey research for the construction of aggregated scales. Yet such a precision is probably unattainable given the necessarily limited quality of historical data stretching over 150 years.

9. The relation between fluctuations of economic growth and social stability

Given that we have identified an aggregated indicator of social destabilization the question remains as to how it relates to fluctuations of economic growth. Again I combine two approaches to answer this question. On the one hand, I overlay graphically the aggregated indicator of social destabilization with the indicator of economic growth (Figure 6). This allows a graphical interpretation of the observed pattern. On the other hand, I compute cross-correlation functions across lags from -7 to +7 years (see Figure 7).

The pattern I expect on the basis of the aforementioned theoretical model is as follows: in the overlayed graphical presentations, the beginning of economic growth should be accompanied by increasing stability. At the end of a prosperity phase, I expect growing instability. Destabilization should be at its peak

Figure 5 Aggregated Indicator of Destabilization–Stabilization (Z-Transformed)

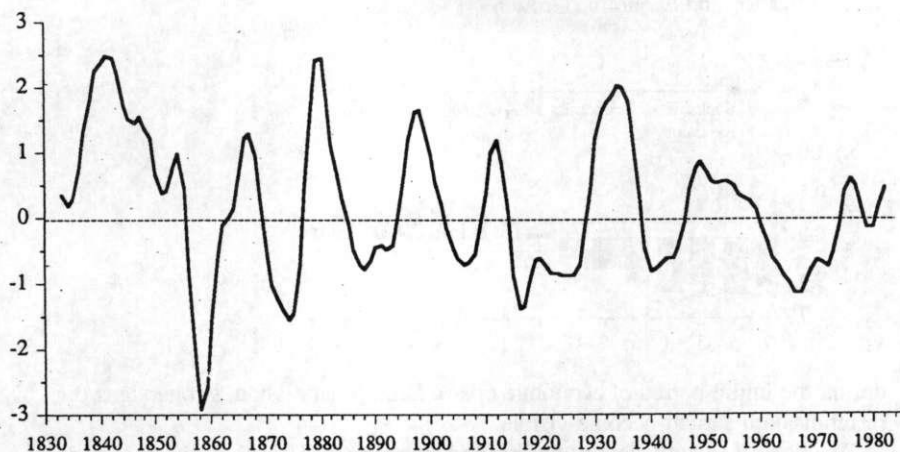


Figure 6 Overlaid Series of Social Destabilization and Economic Growth

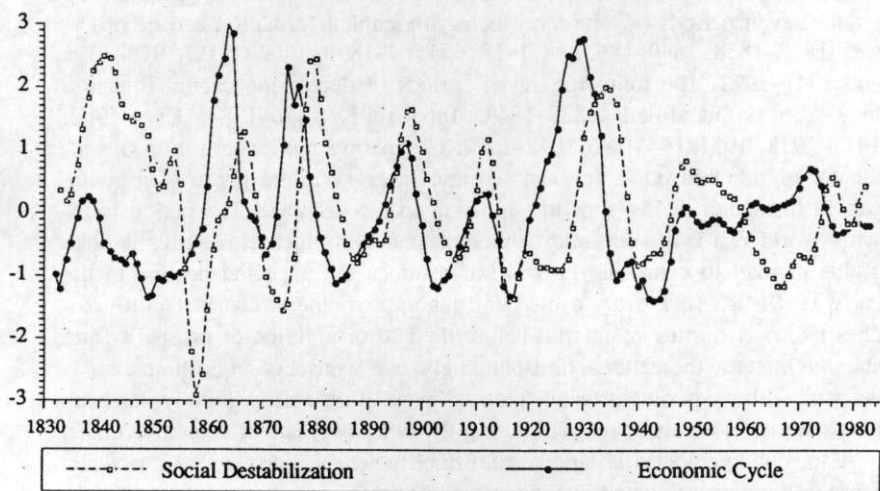
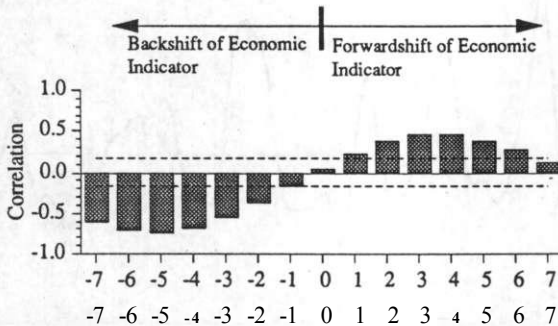


Figure 7

Cross-Correlations from -7 to +7 Years between Indicators of Social Destabilization and Economic Growth



during the initial period of economic crises. During depression, strong signs of restabilisation should become visible.

This pattern is equivalent to two shifted sine curves. Therefore, the expected cross-correlation itself is expected to have the shape of a sine-wave: shifting the economic indicator backwards in time is expected to yield negative correlations, and shifting the economic indicator forwards should yield positive correlations. As the average length of the observed cycles is about 16 years, we expect maximum correlations at a shift of 3 to 5 years. (12)

In order to test these hypotheses, consider the graphs in Figure 6 first. Looking at the economic indicator, one can easily read a periodization from the graph. Seven periods of long-term increasing capital formation can be observed: 1832-1838, 1849-1863, 1871-1876, 1884-1899, 1902-1912, 1918-1931 and 1941-1972. The following seven periods of decreasing capital formation may also be identified: 1838-1849, 1863-1871, 1876-1884, 1899-1902, 1912-1918, 1931-1941 and 1972-1977. Comparing this pattern with the indicator of destabilization one can see that in *every* initial phase of growing capital formation the level of instability is on the decrease. The period following World War II is a partial exception, as instability increases during the late 1940s parallel to economic growth but resumes the expected decline in the early 1950/2s. Also, every cycle confirms the hypothesis that instability reaches its lower turning point well before the end of a period of prosperity and starts to increase thereafter. Correspondingly, every onset of an economic crisis is found within a period of fast increasing levels of instability. Finally, the peak of instability is regularly reached during the first few years of economic crisis.

Also, our hypothesis is largely confirmed when we look at the cross-correlation function presented in Figure 7. Shifting the economic indicator backwards in time (= negative values of the time-lag) the correlation shows increasingly negative values reaching a low of -0.735 at a backshift of five years.

This finding may be interpreted as follows: on the average, social destabilization is at its lowest point approximately five years before the peak of the economic cycle. Conversely the peak of social destabilization is reached five years before the lower turning point of capital formation. Shifting the economic indicator forwards in time correlations become increasingly larger and reach a peak of 0.476 at a forward shift of three years. Again this may be interpreted in the following way: on the average, social destabilization is at its highest three years after the upper turning point of the economic cycle. Vice versa, stability is highest three years after the start of an economic upswing.

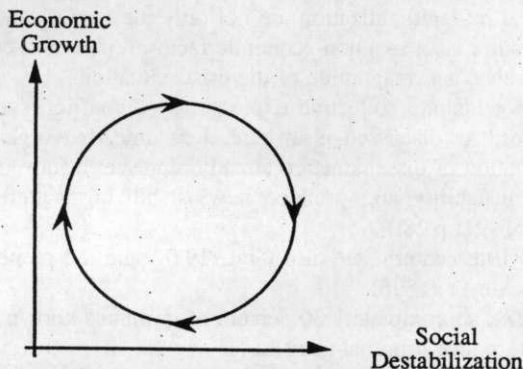
10. Final remarks

During the last 150 years a similar process has occurred repeatedly. It is characterized by social destabilization during the second half of an economic upswing, maximum instability during the first years of economic crisis, the resumption of stability during the depression period and maximum stability in the initial period of economic growth.

This pattern supports a theoretical approach that models the interaction between economic growth and social destabilization as a circular movement.

Figure 8

Theoretical Model of the Interdependency of Economic Growth and Social Destabilization



The results presented here largely support this model. However, the causal paths that generate the observed mutual effects remain hidden inside an empirical black box. Thus, our data cannot answer precisely the question as to which processes undermine stability during a growth period and as to how stability is resumed during depression. Research done on the dynamics of cultural orientations in the canton of Zurich has shown that growing emotional and cognitive insecurity during economic expansion on the one hand, and the re-

sumption of a coherent world-view on the other hand, may add to our understanding of the process (Eisner 1991, 1992).

All in all, the results of the research presented here seem to support a strategy in historical social research that accumulates related cultural, political, social and economic indicators for a limited area. These may then be examined by available statistical methods. It goes without saying that the existence of comparable sets of data would greatly enhance the accumulation of respective knowledge.

References

- (1) With this, the study contributes not least to a synthesis between historic social research and sociology (Thome, 1992 No. 342).
- (2) My translation.
- (3) Both theories 1/2 emphasis on cultural-communicative aspects in explaining the dynamics of stability and crisis continue to be found in the considerations of Imhof/Romano (1988a, 1988b) and Eisner (1991).
- (4) This has its roots in modernization theory approaches, as formulated in the 1960/2s especially by Ted Robert Gurr (1970), Chalmers Johnson (1973), James Davies (1962) and Mancur Olson (1971) in order to adequately specify the conditions for political system crises.
- (5) A number of authors extend this expectation to hypothesize that destabilization and political de-legitimatization are not only the consequence of rapid growth, but rather also, as a non-economic factor, represent a causal factor in the occurrence and magnitude of the crisis situation.
- (6) However, we do not include collective expressions of conflict, such as frequency of strikes. As discussed elsewhere, I assume that organized forms of the articulation of dissatisfaction already represent a form of the transformation of instability and produce new, stabilizing patterns of orientation (Eisner 1991; p.28f).
- (7) With regard to the 19th century, see also Graf (1978) and the pioneer in Swiss criminology Meyer (1895).
- (8) In the early 1980/2s, approximately 30 percent of criminals known were minors according to police criminal statistics.
- (9) Here we did not include civil suits having low amounts in dispute (up to 1953, 50 Swiss francs; up to 1976, 100 Swiss francs; up to 1983, 200 Swiss francs; today, 300 Swiss francs) and where the justice of the peace rules as the last instance, nor did we include hearings on slander.
- (10) With filter weights 0.08, 0.54, 1.00, 0.54, 0.08.
- (11) The filter program used here was developed by Hugo Mader to whom I give thanks.
- (12) Because the sine-waves are expected to be shifted by 1/4 of a full cycle.

Bibliography

- Balvig, Flemming (1990). *Weiss wie Schnee; Die verborgene Wirklichkeit der Kriminalität in der Schweiz*. Bielefeld: AJZ.
- Beck, Bernhard (1979). *Lange Wellen wirtschaftlichen Wachstums in der Schweiz; eine Untersuchung der Hochbauinvestitionen und ihrer Bestimmungsgründe*. Bern: Haupt.
- Bernegger, Michael (1983). *Die schweizerische Wirtschaft 1850-1913; Struktur, Wachstum, Konjunktur*, (unpublished manuscript).
- Bornschiefer, Volker (1988). *Westliche Gesellschaft im Wandel*. Frankfurt am Main: Campus.
- Chesnais, Jean-Claude (1981). *Histoire de la Violence en Occident de 1800 à nos jours*. Paris: Robert Laffont.
- Davies, James C. (1962). »Toward a Theory of Revolution«, in: *American Sociological Review*, 27, 5-18.
- Dürkheim, Emile (1983). *Der Selbstmord*. Frankfurt am Main: Suhrkamp.
- Eisner, Manuel (1990). »Long-Term Dynamics of Political Values in International Perspective: Comparing the Results of Content Analysis of Political Documents in the USA, GB, FRG and Switzerland«, in: *European Journal of Political Research*, 18, 605-621.
- Eisner, Manuel (1991a). *Politische Sprache und sozialer Wandel; Eine quantitative und semantische Analyse von Neujahrsleitartikeln in der Schweiz von 1840 bis 1987*. Zürich: Seismo.
- Eisner, Manuel (1991b). »Wer sind «Wir»? Wandel der politischen Identität in der Schweiz 1840-1987«, in: Schweizerisches Sozialarchiv (ed.), *Bilder und Leitbilder im sozialen Wandel*, Zürich: Chronos.
- Eisner, Manuel (1992). »Politische Orientierungen und Rhythmen des sozialen Wandels«, in: *Schweizerische Zeitschrift für Soziologie*, 18, 1, 29-54.
- Ewijk, Casper van (1982). »A Spectral Analysis of the Kondratieff-Cycle«, in: *Kyklos*, 35, 3, 468-499.
- Giddens, Anthony (1988). *Die Konstitution der Gesellschaft; Grundzüge einer Theorie der Strukturierung*. Frankfurt am Main: Campus.
- Graf, Erich Otto (1978). *Kriminalität und sozialer Wandel; eine soziologische Untersuchung der Kriminalität im Kanton Zürich zwischen 1850 und dem Ersten Weltkrieg*. (Lizentiatsarbeit eingereicht an der Philosophischen Fakultät I der Universität Zürich).
- Granger, C. W. J. and M. Hatanaka (1964). *Spectral Analysis of Economic Time Series*. Princeton: Princeton University Press.
- Gurr, Ted Robert (1970). *Why Men Rebel*. Princeton: Princeton University Press.
- Gurr, Ted Robert (1981). »Historical Trends in Violent Crime: A Critical Review of the Evidence« in: *Crime and Justice. An Annual Review of Research*, 3, 295-350.

- Hacker, Erwin (1939). *Die Kriminalität des Kantons Zürich; Versuch einer Kriminalätiologie des Kantons Zürich*. Mischolc.
- Henry, Andrew and James Short (1964). *Suicide and Homicide*. New York.
- Hirsch, Fred (1976). *Social Limits to Growth*. Cambridge.
- Imhof, Kurt and Gaetano Romano (1988a). »Krise und sozialer Wandel«, in: O. Weinberger (ed.). *Internationale Jahrbücher für Rechtsphilosophie und Gesetzgebung*, Wien.
- Imhof, Kurt and Gaetano Romano (1988b). »Sozialer Wandel und Rechtsproduktion«, in: *Schweizerische Zeitschrift für Soziologie*, 14, 2, 247-296.
- Imhof, Kurt and Gaetano Romano (1989). *Theorie des sozialen Wandels. Dissertation an der Philosophischen Fakultät I der Universität Zürich*.
- Johnson, Chalmers (1973). »Bedingungen der Revolution«, in: Martin Jänicke (ed.). *Politische Systemkrisen*, Köln.
- Metz, Rainer (1988). »Ansätze, Begriffe und Verfahren der Analyse ökonomischer Zeitreihen«, in: *Historical Social Research - Historische Sozialforschung*, 13, 3, 23-104.
- Metz, Rainer and Winfried Stier (1992). »Filter Design in the Frequency Domain«, in: Alfred Kleinknecht, Ernest Mandel and Immanuel Wallerstein (eds.). *New Findings in Long Wave Research*, London: Macmillan.
- Metz, Rainer and Helmut Thome (1990). »Verläufe der langfristige Wertwandel zyklisch? Eine zeitreihenanalytische Überprüfung der These von Namenwirth und Weber«, in: Best and Helmut Thome (eds.), *Neue Methoden der Analyse historischer Daten*, St. Katharinen: Scripta Mercuriae.
- Meyer, Albert (1895). *Die Verbrechen in ihrem Zusammenhang mit den wirtschaftlichen und sozialen Verhältnissen im Kanton Zürich*. Jena.
- Olson, Mancur (1971). »Rapid Growth as Destabilising Factor« in: James Ch. Davies (ed.). *When Men Revolt and Why*, New York.
- Sehlingen, R. and B. H. J. Streitberg (1987). *Zeitreihenanalyse*. München.
- Siegenthaler, Hansjörg (1978). »Kapitalbildung und sozialer Wandel in der Schweiz 1850 bis 1914«, in: *Jahrbücher für Nationalökonomie und Statistik*, 193, 1.
- Siegenthaler, Hansjörg (1980). »Ansätze zur Interpretation des Zusammenhangs von langfristigen Wachstumsschwankungen und sozio-politischem Strukturwandel«, in: Wilhelm H. Schröder and R. Spree (eds.), *Historische Konjunkturforschung*, Stuttgart: Klett.
- Siegenthaler, Hansjörg (1981). »Ansätze zu einer generalisierenden Interpretation langweiliger Wachstumsschwankungen und ihrer sozialer Implikationen im frühen 19. und 20. Jahrhundert«, in: H. Kellenbenz (ed.). *Wachstumsschwankungen, wirtschaftliche und soziale Auswirkungen*.
- Siegenthaler, Hansjörg (1984). »Vertrauen, Erwartungen und Kapitalbildung im Rhythmus von Strukturperioden wirtschaftlicher Entwicklung: Ein Beitrag zur theoriegeleiteten Konjunkturgeschichte«, in: G. Bombach, B. Gahlen and A.E. Ott (eds.), *Perspektiven der Konjunkturforschung*, Tübingen.

- Soziologisches Institut, der Universität Zürich (Hrsg.) (1978). *Almanack der Schweiz; Daten und Kommentare zu Bevölkerung, Gesellschaft und Politik*. Zürich: .
- Stier, Winfried (1989). »Basic Concepts and New Methods of Time Series Analysis in Historical Social Research«, in: *Historical Social Research - Historische Sozialforschung*, 14, 1, 3-25.
- Thome, Helmut (1992). »Gesellschaftliche Modernisierung und Kriminalität; Zum Stand der sozialhistorischen Kriminalitätsforschung.«, in: *Zeitschrift für Soziologie*, 21, 3, 212-228.
- Zehr, Howard (1976). *Crime and the Development of Modern Society; Patterns of Criminality in 19th Century Germany and France*. Totowa.

Appendix

The Data

In the following, all data used in the analysis are described and listed. Some additional data are also presented which were not investigated in the present paper.

(1) Year

(2) Population (14 Years of Age, in Hundreds)

In order to calculate population rates, all raw data was applied to the population of the canton of Zurich older than 14 years of age. Data differentiated according to age has been collected since 1870 in the national census. For non-census years, the values were extrapolated linearly. Prior to 1870, the values were calculated from data on the total population using a constant age distribution as a basis.

(3) Gross Building Investments (in 1000 Swiss Francs)

- Up until 1913, the data stems from Beck (1979), based upon annual estimates by the public fire insurance institution (Brandversicherungsanstalt)
- From 1914 to 1945, the data is based upon estimates of annual increases in the insurance value of buildings assessed by the cantonal fire insurance, found in reports »Rechenschaftsberichten des Regierungsrates an den Kantonsrat«. This data is therefore a continuation of Beckl/2s (1979) data.
- For the period from 1946 onwards, the data is based upon estimates of building investments performed by the »Bundesamt für Konjunkturfragen«, whereby private and public investments, but without public maintenance works, were included. Due to the overlapping period between 1942 and 1945, we found that the estimates of the »Bundesamt für Konjunkturfragen« are approximately 22 % lower than those of the cantonal

fire insurance (Brandversicherungsanstalt). Therefore, the data from 1946 onwards was multiplied by the factor 1,28 for the above analyses.

(4) Inflation index

- From 1950 to 1913, the index of building costs presented is based upon Berneggerl/2s (1983) data.
- From 1914 on, extrapolations of the building costs index of the city of Zurich, published in the Statistical Yearbook of the City of Zurich, was used.

(5) Legal seizure or distraint

- For the entire period, the data are based upon frequencies of orders to pay given in the reports of the higher court of the canton of Zurich (Rechenschaftsberichte des Obergerichtes des Kantons Zürich). For data see also Meyer (1895: p. 162ff, to 1891) and Hacker (1939: p. 66ff, to 1936); for an overview see also »Almanach der Schweiz« (Soziologisches Institut 1978: p. 222ff).
- The data contain a point of irregularity in 1891/1892 due to the introduction of a new distraint and bankruptcy law (Das eidgenössische Bundesgesetz über Schuldbetreibung und Konkurs) which defined more restrictively the conditions to be met for legal distraint than had been defined previously by the canton. For the above graphs and calculations, therefore, the data from 1832 to 1891 were corrected using the factor 0.586.

(6) Bankruptcy

- Data source and problems are identical to those discussed in terms of legal seizure or distraint (see above).

(7) Civil Suits

- The data here comprise civil suits settled in conciliatory hearings with the office of the justice of the peace. Throughout the entire period they were published in the reports of the court (Rechenschaftsberichten des Obergerichtes des Kantons Zürich). Up to 1891, the data is also found in Meyer (1895: p.162ff); for an overview see also »Almanach der Schweiz« (Soziologisches Institut 1978: p.222ff)

(8) Suicides

From 1850 to 1867 the frequency of officially registered suicides was taken from the annual reports »Rechenschaftsberichte des Regierungsrates an den Kantonsrat«. Figures following this period are found in the Statistical Yearbook of Switzerland (Statistisches Jahrbuch der Schweiz).

(9) Convicted Persons

The data for convicted persons is based mainly upon two *sources*:

- From 1853 to 1931, the figures in Hacker (1939: p.23f) were used,

which are based upon detailed data in the annually published »Rechenschaftsberichte des Obergerichts«.

- From 1931 onwards, frequencies of convicted persons listed in the »Statistisches Jahrbuch der Schweiz« were used.
- From 1970 on, convictions according to the drug law (Betäubungsmittelgesetzes) were included.

(10) Offences against Property

- Data source as in (8) above.

(11) Violent Offences

Data source as in (8) above. 1940/1941 probably contains an irregularity; the reason for this, however, has at present not been identified.

(12) Size of Police Force

- Data tapped include size of the cantonal and city police forces; administrative personnel and local police are not included.
- The discontinuity in 1892/1893 is caused by an enlargement of the city limits which then took place.
- From 1930 onwards, the long-term trend is mainly a reflection of increases in the traffic police force.

(13) Divorces

- Up to 1867, the data stem from the »Rechenschaftsbericht des Regierungsrates an den Kantonsrat«.
- From 1868 on, the data are contained in the »Statistisches Jahrbuch der Schweiz« and the »Statistisches Handbuch des Kantons Zürich«.

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|------|------|------|-----|--------|-----|------|-----|-----|------|------|------|------|
| 1832 | 1600 | 4297 | • | • | 253 | 7070 | • | • | • | • | • | • |
| 1833 | 1605 | 2890 | • | 70444 | 359 | 6746 | • | • | • | • | • | • |
| 1834 | 1610 | 5079 | • | 67486 | 239 | 7001 | • | • | • | • | • | • |
| 1835 | 1615 | 4966 | • | 66629 | 240 | 6918 | • | • | • | • | • | • |
| 1836 | 1620 | 5502 | • | 74548 | 216 | 7058 | • | • | • | • | • | • |
| 1837 | 1625 | 6876 | • | 90753 | 258 | 7750 | • | • | • | • | • | • |
| 1838 | 1630 | 7376 | • | 105808 | 318 | 8372 | • | • | • | • | • | • |

| | | | | | | | | | | | | |
|------|------|-------|----|--------|-----|------|----|------|-----|-----|-----|----|
| 1839 | 1635 | 5858 | • | 108547 | 391 | 8021 | • | • | • | • | • | • |
| 1840 | 1640 | 5373 | Æ | 118727 | 559 | 8601 | • | • | • | • | • | • |
| 1841 | 1650 | 3876 | • | 113418 | 517 | 8973 | • | • | • | • | • | • |
| 1842 | 1660 | 4294 | • | 117071 | 470 | 8351 | • | • | • | • | • | • |
| 1843 | 1670 | 4062 | • | 115047 | 585 | 7925 | • | • | • | • | • | • |
| 1844 | 1680 | 3535 | • | 126037 | 615 | 8428 | • | • | • | • | • | • |
| 1845 | 1690 | 2699 | • | 115936 | 541 | 7245 | • | • | • | • | • | • |
| 1846 | 1700 | 3823 | • | 113325 | 422 | 7045 | • | • | • | • | • | • |
| 1847 | 1710 | 3415 | • | 117067 | 530 | 6427 | • | • | • | • | • | • |
| 1848 | 1720 | 2849 | • | 149053 | 822 | 7380 | • | • | • | • | • | • |
| 1849 | 1730 | 1945 | • | 122031 | 745 | 6572 | • | • | • | • | • | • |
| 1850 | 1740 | 1955 | 46 | 106269 | 511 | 5768 | 29 | • | • | • | • | • |
| 1851 | 1760 | 2790 | 46 | 105143 | 409 | 6514 | 31 | • | • | • | • | • |
| 1852 | 1775 | 2344 | 45 | 103189 | 375 | 6890 | 29 | • | • | • | • | • |
| 1853 | 1795 | 2990 | 46 | 106065 | 395 | 6834 | 34 | 2237 | 810 | 110 | • | • |
| 1854 | 1807 | 2954 | 48 | 122864 | 496 | 6439 | 54 | 2368 | 960 | 118 | • | • |
| 1855 | 1818 | 2987 | 48 | 120584 | 519 | 6471 | 33 | 2253 | 950 | 88 | • | 71 |
| 1856 | 1829 | 2751 | 49 | 99082 | 376 | 5392 | 30 | 1879 | 679 | 112 | • | 70 |
| 1857 | 1840 | 4180 | 54 | 77794 | 191 | 4630 | 34 | 1651 | 621 | 126 | • | 82 |
| 1858 | 1851 | 5373 | 56 | 65158 | 129 | 4182 | 27 | 1449 | 520 | 144 | • | 61 |
| 1859 | 1863 | 5750 | 57 | 59847 | 119 | 4546 | 25 | 1632 | 425 | 141 | • | 95 |
| 1860 | 1875 | 7312 | 60 | 95877 | 131 | 4761 | 38 | 1628 | 505 | 141 | • | 88 |
| 1861 | 1888 | 10427 | 65 | 116201 | 151 | 5554 | 49 | 1698 | 649 | 139 | 164 | 75 |
| 1862 | 1901 | 16677 | 66 | 120140 | 169 | 5598 | 57 | 1764 | 699 | 234 | 167 | 77 |
| 1863 | 1914 | 19869 | 67 | 117689 | 212 | 5782 | 46 | 1861 | 641 | 235 | 169 | 82 |
| 1864 | 1927 | 16512 | 66 | 139851 | 268 | 6262 | 53 | 1575 | 670 | 198 | 176 | 80 |
| 1865 | 1940 | 11587 | 66 | 155373 | 430 | 6868 | 73 | 1722 | 692 | 241 | 175 | 77 |
| 1866 | 1953 | 13896 | 64 | 159660 | 449 | 6785 | 47 | 1691 | 623 | 164 | 178 | 94 |
| 1867 | 1966 | 9316 | 64 | 169719 | 675 | 8762 | 62 | 1602 | 994 | 180 | 178 | 96 |

| | | | | | | | | | | | | |
|------|------|-------|-----|--------|-----|------|-----|------|------|-----|-----|-----|
| 1868 | 1979 | 7628 | 64 | 156266 | 689 | 8320 | 69 | 1650 | 978 | 230 | 173 | 97 |
| 1869 | 1993 | 9500 | 65 | 131886 | 477 | 7178 | 61 | 1512 | 853 | 208 | 160 | 120 |
| 1870 | 2006 | 7502 | 67 | 123724 | 438 | 6929 | 53 | 1385 | 796 | 188 | 161 | 130 |
| 1871 | 2028 | 6994 | 68 | 121134 | 456 | 6447 | 47 | 1327 | 752 | 222 | 157 | 110 |
| 1872 | 2049 | 12598 | 80 | 100293 | 340 | 6641 | 53 | 1429 | 824 | 217 | 158 | 127 |
| 1873 | 2071 | 17015 | 96 | 97359 | 271 | 6405 | 52 | 1446 | 868 | 203 | 162 | 139 |
| 1874 | 2093 | 22332 | 98 | 94192 | 218 | 6026 | 55 | 1488 | 852 | 231 | 163 | 130 |
| 1875 | 2115 | 29692 | 97 | 88403 | 209 | 5046 | 54 | 1495 | 733 | 350 | 164 | 147 |
| 1876 | 2137 | 45666 | 99 | 93670 | 186 | 5877 | 62 | 1707 | 1036 | 287 | 161 | 261 |
| 1877 | 2158 | 38638 | 97 | 113471 | 241 | 6746 | 83 | 1959 | 1164 | 298 | 171 | 216 |
| 1878 | 2180 | 31322 | 94 | 136994 | 350 | 7486 | 104 | 2099 | 1179 | 281 | 160 | 212 |
| 1879 | 2202 | 26330 | 91 | 154025 | 572 | 8046 | 103 | 2165 | 1182 | 301 | 156 | 218 |
| 1880 | 2224 | 20159 | 85 | 149746 | 705 | 7604 | 90 | 2264 | 1322 | 307 | 159 | 221 |
| 1881 | 2243 | 18744 | 84 | 142119 | 647 | 7595 | 96 | 2214 | 1241 | 282 | 159 | 216 |
| 1882 | 2262 | 17711 | 84 | 137625 | 586 | 7224 | 98 | 2053 | 1130 | 256 | 154 | 241 |
| 1883 | 2280 | 14327 | 84 | 127621 | 756 | 6820 | 99 | 1851 | 1002 | 230 | 165 | 200 |
| 1884 | 2299 | 11803 | 84 | 123357 | 642 | 5967 | 89 | 1922 | 992 | 227 | 164 | 198 |
| 1885 | 2318 | 14461 | 84 | 112740 | 428 | 5620 | 85 | 1858 | 929 | 235 | 168 | 183 |
| 1886 | 2337 | 16210 | 85 | 110753 | 402 | 5650 | 83 | 1824 | 956 | 233 | 172 | 214 |
| 1887 | 2356 | 20251 | 85 | 113887 | 361 | 5510 | 93 | 1878 | 1017 | 249 | 173 | 182 |
| 1888 | 2375 | 20405 | 89 | 108744 | 387 | 5471 | 84 | 1753 | 945 | 281 | 173 | 171 |
| 1889 | 2433 | 26758 | 93 | 109359 | 348 | 5455 | 79 | 1840 | 956 | 302 | 176 | 173 |
| 1890 | 2492 | 32022 | 95 | 111283 | 371 | 5535 | 88 | 2091 | 1114 | 328 | 179 | 173 |
| 1891 | 2550 | 37466 | 97 | 123618 | 335 | 5938 | 107 | 2063 | 1135 | 345 | 176 | 173 |
| 1892 | 2609 | 36305 | 97 | 72406 | 102 | 5725 | 93 | 2141 | 1153 | 390 | 181 | 185 |
| 1893 | 2667 | 45246 | 97 | 69948 | 131 | 5529 | 108 | 2195 | 1219 | 362 | 261 | 164 |
| 1894 | 2726 | 57553 | 100 | 79838 | 150 | 5949 | 99 | 2252 | 1179 | 438 | 271 | 171 |
| 1895 | 2784 | 66814 | 101 | 101674 | 158 | 6673 | 121 | 2347 | 1202 | 426 | 295 | 202 |
| 1896 | 2843 | 75060 | 103 | 127576 | 150 | 8130 | 107 | 2584 | 1377 | 464 | 295 | 219 |

| | | | | | | | | | | | | |
|------|------|--------|-----|--------|-----|-------|-----|------|------|-----|-----|-----|
| 1897 | 2904 | 74401 | 103 | 129399 | 181 | 8688 | 103 | 2724 | 1428 | 479 | 373 | 228 |
| 1898 | 2950 | 71819 | 104 | 123156 | 237 | 8331 | 119 | 2881 | 1516 | 491 | 391 | 242 |
| 1899 | 3018 | 72388 | 101 | 110061 | 267 | 8205 | 120 | 2852 | 1416 | 547 | 397 | 282 |
| 1900 | 3077 | 52424 | 100 | 112150 | 281 | 7938 | 139 | 2617 | 1343 | 445 | 396 | 238 |
| 1901 | 3130 | 38343 | 99 | 108046 | 378 | 7188 | 140 | 2699 | 1386 | 413 | 402 | 212 |
| 1902 | 3184 | 27152 | 99 | 105039 | 303 | 6831 | 146 | 2548 | 1362 | 376 | 398 | 270 |
| 1903 | 3238 | 30784 | 103 | 98421 | 295 | 6833 | 114 | 2550 | 1390 | 342 | 404 | 255 |
| 1904 | 3291 | 37128 | 104 | 98421 | 264 | 6697 | 135 | 2589 | 1356 | 393 | 395 | 288 |
| 1905 | 3345 | 37275 | 109 | 98351 | 254 | 6936 | 133 | 2499 | 1308 | 374 | 401 | 314 |
| 1906 | 3398 | 52070 | 118 | 94469 | 253 | 6781 | 112 | 2669 | 1365 | 386 | 408 | 296 |
| 1907 | 3452 | 60545 | 125 | 95263 | 196 | 7201 | 107 | 2837 | 1375 | 590 | 413 | 336 |
| 1908 | 3505 | 70869 | 123 | 104634 | 191 | 8225 | 127 | 3036 | 1487 | 581 | 435 | 368 |
| 1909 | 3559 | 76655 | 124 | 108991 | 225 | 8592 | 111 | 3061 | 1571 | 522 | 473 | 317 |
| 1910 | 3613 | 95177 | 125 | 114222 | 238 | 9189 | 122 | 3247 | 1640 | 568 | 475 | 355 |
| 1911 | 3664 | 108504 | 127 | 126819 | 276 | 10196 | 129 | 3319 | 1726 | 486 | 479 | 355 |
| 1912 | 3714 | 85333 | 127 | 131727 | 310 | 10081 | 157 | 3510 | 1783 | 500 | 474 | 363 |
| 1913 | 3765 | 68791 | 128 | 137179 | 272 | 9850 | 161 | 3687 | 1935 | 496 | 506 | 392 |
| 1914 | 3816 | 67607 | 100 | 122823 | 249 | 8328 | 140 | 3126 | 1576 | 364 | 510 | 356 |
| 1915 | 3867 | 37198 | 119 | 118142 | 297 | 7317 | 134 | 2550 | 1412 | 298 | 501 | 353 |
| 1916 | 3918 | 42408 | 140 | 99520 | 191 | 7091 | 112 | 3012 | 1686 | 280 | 516 | 386 |
| 1917 | 3969 | 47459 | 180 | 91559 | 125 | 7194 | 100 | 3325 | 1936 | 207 | 501 | 405 |
| 1918 | 4020 | 92555 | 229 | 88769 | 81 | 8006 | 139 | 3982 | 2357 | 314 | 513 | 425 |
| 1919 | 4071 | 107378 | 259 | 85830 | 124 | 8997 | 120 | 3312 | 1884 | 278 | 595 | 544 |
| 1920 | 4121 | 170178 | 243 | 86731 | 164 | 9092 | 137 | 3254 | 1696 | 404 | 632 | 578 |
| 1921 | 4203 | 208363 | 228 | 93034 | 199 | 10024 | 148 | 2989 | 1624 | 356 | 626 | 506 |
| 1922 | 4284 | 148265 | 201 | 120185 | 272 | 9272 | 148 | 2833 | 1434 | 334 | 603 | 569 |
| 1923 | 4365 | 140238 | 188 | 121328 | 240 | 8991 | 148 | 3089 | 1419 | 325 | 611 | 505 |
| 1924 | 4446 | 203558 | 182 | 124560 | 202 | 9378 | 156 | 2833 | 1450 | 399 | 612 | 538 |
| 1925 | 4527 | 232781 | 173 | 140098 | 210 | 9663 | 137 | 2702 | 1369 | 451 | 618 | 592 |

| | | | | | | | | | | | | |
|------|------|--------|-----|--------|-----|-------|-----|------|------|-----|------|------|
| 1926 | 4606 | 235330 | 167 | 136707 | 202 | 10514 | 131 | 2975 | 1474 | 484 | 605 | 620 |
| 1927 | 4680 | 243435 | 163 | 151289 | 235 | 10514 | 130 | 2885 | 1419 | 525 | 623 | 670 |
| 1928 | 4771 | 275324 | 161 | 156542 | 246 | 11309 | 174 | 3201 | 1668 | 661 | 595 | 728 |
| 1929 | 4852 | 282599 | 158 | 174603 | 248 | 12140 | 162 | 3238 | 1631 | 741 | 632 | 786 |
| 1930 | 4933 | 288016 | 154 | 184706 | 286 | 13198 | 202 | 3646 | 1918 | 769 | 632 | 819 |
| 1931 | 4983 | 296955 | 150 | 209042 | 287 | 13761 | 186 | 3287 | 1709 | 857 | 634 | 880 |
| 1932 | 5033 | 242281 | 144 | 228770 | 420 | 14843 | 225 | 3254 | 1679 | 797 | 655 | 923 |
| 1933 | 5083 | 165706 | 139 | 230093 | 483 | 14273 | 208 | 3317 | 1706 | 808 | 706 | 962 |
| 1934 | 5133 | 166465 | 137 | 228104 | 581 | 13965 | 195 | 3541 | 1835 | 813 | 717 | 955 |
| 1935 | 5183 | 106750 | 134 | 231696 | 542 | 14093 | 195 | 3911 | 2015 | 905 | 729 | 946 |
| 1936 | 5233 | 71130 | 131 | 229188 | 633 | 12718 | 201 | 3944 | 2113 | 846 | 768 | 969 |
| 1937 | 5283 | 91850 | 139 | 204591 | 440 | 11211 | 183 | 3565 | 1954 | 719 | 749 | 1002 |
| 1938 | 5333 | 125369 | 140 | 180919 | 325 | 10155 | 155 | 3605 | 1920 | 799 | 806 | 977 |
| 1939 | 5383 | 133199 | 141 | 154061 | 247 | 9038 | 193 | 3148 | 1599 | 740 | 785 | 938 |
| 1940 | 5433 | 87383 | 159 | 151530 | 231 | 8025 | 173 | 2928 | 1633 | 629 | 801 | 843 |
| 1941 | 5483 | 154484 | 183 | 158063 | 194 | 8224 | 183 | 2885 | 1776 | 445 | 789 | 893 |
| 1942 | 5562 | 132531 | 206 | 144411 | 217 | 8542 | 198 | 2537 | 1656 | 184 | 842 | 963 |
| 1943 | 5641 | 146252 | 215 | 143974 | 215 | 8581 | 196 | 2836 | 1857 | 158 | 835 | 903 |
| 1944 | 5720 | 164410 | 223 | 148493 | 160 | 8574 | 207 | 2507 | 1641 | 161 | 847 | 915 |
| 1945 | 5799 | 184451 | 231 | 138274 | 206 | 9474 | 228 | 2790 | 1826 | 184 | 850 | 1032 |
| 1946 | 5878 | 234315 | 249 | 137648 | 217 | 10144 | 215 | 2934 | 1847 | 308 | 840 | 1251 |
| 1947 | 5957 | 398236 | 250 | 154664 | 238 | 11474 | 179 | 3274 | 1982 | 348 | 849 | 1231 |
| 1948 | 6037 | 495772 | 254 | 165113 | 238 | 12546 | 204 | 3257 | 1990 | 280 | 877 | 1230 |
| 1949 | 6116 | 445645 | 249 | 188422 | 308 | 12803 | 176 | 3119 | 1861 | 307 | 933 | 1230 |
| 1950 | 6195 | 460907 | 273 | 179250 | 418 | 12883 | 219 | 3128 | 1901 | 262 | 999 | 1269 |
| 1951 | 6334 | 617514 | 283 | 184152 | 366 | 12028 | 172 | 3129 | 1826 | 242 | 975 | 1211 |
| 1952 | 6473 | 582852 | 278 | 183731 | 314 | 12315 | 200 | 3109 | 1847 | 236 | 1036 | 1231 |
| 1953 | 6612 | 587630 | 270 | 193158 | 314 | 12250 | 176 | 3227 | 1750 | 265 | 1024 | 1245 |
| 1954 | 6751 | 639266 | 277 | 187282 | 335 | 11219 | 236 | 3192 | 1711 | 275 | 1077 | 1242 |

| | | | | | | | | | | | | |
|------|------|---------|------|--------|-----|-------|-----|------|------|-----|------|------|
| 1955 | 6890 | 715002 | 288 | 191103 | 336 | 11373 | 203 | 3265 | 1743 | 304 | 1104 | 1228 |
| 1956 | 7029 | 812500 | 296 | 189940 | 323 | 11617 | 194 | 3304 | 1693 | 313 | 1152 | 1211 |
| 1957 | 7169 | 844460 | 306 | 196673 | 317 | 11826 | 181 | 3283 | 1780 | 282 | 1212 | 1300 |
| 1958 | 7308 | 767206 | 310 | 190183 | 296 | 11967 | 216 | 3428 | 1834 | 316 | 1264 | 1193 |
| 1959 | 7447 | 991953 | 313 | 191057 | 323 | 11309 | 191 | 3409 | 1781 | 319 | 1311 | 1301 |
| 1960 | 7586 | 1179092 | 326 | 169595 | 277 | 10861 | 198 | 3399 | 1865 | 300 | 1358 | 1244 |
| 1961 | 7704 | 1339788 | 350 | 165093 | 272 | 10723 | 175 | 3460 | 1846 | 349 | 1400 | 1259 |
| 1962 | 7823 | 1436788 | 375 | 153409 | 263 | 11002 | 206 | 3477 | 1807 | 374 | 1450 | 1350 |
| 1963 | 7941 | 1651786 | 408 | 156687 | 264 | 11286 | 183 | 3380 | 1825 | 302 | 1504 | 1243 |
| 1964 | 8059 | 1927984 | 433 | 148033 | 248 | 11428 | 174 | 3285 | 1730 | 334 | 1566 | 1331 |
| 1965 | 8178 | 1959484 | 446 | 147578 | 276 | 11180 | 182 | 3205 | 1764 | 281 | 1643 | 1296 |
| 1966 | 8296 | 2052883 | 458 | 145748 | 303 | 11190 | 204 | 2951 | 1642 | 260 | 1718 | 1322 |
| 1967 | 8414 | 2102682 | 459 | 164208 | 342 | 11150 | 179 | 3023 | 1684 | 269 | 1790 | 1270 |
| 1968 | 8533 | 2346181 | 468 | 159020 | 334 | 11584 | 218 | 3298 | 1886 | 281 | 1848 | 1444 |
| 1969 | 8651 | 2843276 | 496 | 154033 | 323 | 11118 | 227 | 3198 | 1840 | 289 | 1895 | 1526 |
| 1970 | 8769 | 2982175 | 551 | 155927 | 331 | 11773 | 204 | 3758 | 2133 | 336 | 1893 | 1624 |
| 1971 | 8826 | 3867967 | 615 | 151991 | 300 | 12077 | 209 | 3608 | 1930 | 343 | 1892 | 1646 |
| 1972 | 8883 | 4545762 | 680 | 143258 | 342 | 12296 | 235 | 3714 | 1901 | 392 | 1923 | 1845 |
| 1973 | 8939 | 4999058 | 739 | 148104 | 279 | 12966 | 196 | 3779 | 1959 | 337 | 1965 | 1970 |
| 1974 | 8996 | 5022858 | 790 | 163891 | 347 | 14754 | 236 | 3539 | 1779 | 301 | 1994 | 1886 |
| 1975 | 9052 | 4075266 | 744 | 188182 | 504 | 16479 | 277 | 3674 | 1985 | 339 | 2060 | 1959 |
| 1976 | 9109 | 3522270 | 730 | 189575 | 573 | 17147 | 255 | 3564 | 2062 | 271 | 2187 | 2305 |
| 1977 | 9165 | 3533870 | 753 | 189098 | 612 | 15522 | 293 | 3416 | 1969 | 283 | 2280 | 2621 |
| 1978 | 9222 | 3711769 | 768 | 176688 | 657 | 13737 | 253 | 3691 | 2130 | 317 | 2315 | 2395 |
| 1979 | 9278 | 3807968 | 805 | 175746 | 665 | 13716 | 306 | 4291 | 2478 | 307 | 2367 | 2334 |
| 1980 | 9335 | 4595962 | 879 | 167111 | 654 | 13503 | 258 | 4229 | 2407 | 345 | 2377 | 2539 |
| 1981 | 9340 | 4954736 | 960 | 172320 | 609 | 13806 | 263 | 4266 | 2457 | 343 | 2384 | 2610 |
| 1982 | 9343 | 5066865 | 1073 | 192253 | 682 | 14808 | 293 | 4612 | 2596 | 375 | 2453 | 2520 |
| 1983 | 9341 | 5288010 | 1043 | 201183 | 825 | 14671 | 278 | 4998 | 2878 | 358 | 2494 | 2549 |